

REMARKS

Claims 1-10 and 11-20 are pending in this application. Claims 1-6 are withdrawn from consideration. Claims 7-10 and 13-20 are rejected. Claim 12 is objected to. Claims 1-6 and 11 are canceled herein. Claims 7, 10, 12, 16, 17 and 19 are amended herein. Attached hereto is a marked-up version of the changes made by the current amendment, captioned "Version with Markings to Show Changes Made."

Objections to the Claims

Claims 11 and 12 are objected to as being in improper multiple dependent form.

Claim 11 is herein canceled. Claim 12 is herein amended to properly depend from claims 7 and 10. Applicants submit that this amendment renders the rejection moot.

Rejections under 35 U.S.C. §112, second paragraph

Claims 16 to 20 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The Examiner notes that claims 16-20 are written in narrative form, and do not recite proper method steps.

Applicants herein amend the claims to properly recite method steps. Applicants submit that the present amendment overcomes the rejection.

Rejections under 35 U.S.C. §103(1)

Claims 7-10 and 13-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Honda et al. in view of Zucker and further in view of German No. 938216. The Examiner concludes that it would have been obvious to make work engaging surfaces in the method of Honda et al. with spaced portions to provide minimal contact with the workpiece while keeping the workpiece steady during grinding.

Independent claims 7 and 10 are amended herein to more clearly recite the invention. Claims 7 and 10 now recite the limitation that the work holding portion is adapted to rotate the work around a center of rotation; further that the second surface contacts the work at at least two contacting locations; and further that the center of rotation is between the contacting locations. Applicants submit that the cited combination of references neither teach nor suggest at least these elements. Therefore, claims 7 and 10 should be seen as patentably distinct from the cited combination of references. And because claims 8, 9 and 12-15 are dependent from and necessarily include the limitations of claims 7 and 10, Applicants submit that these claims should be seen as patentably distinct as well.

For at least the above reasons, Applicants submit that the amendments overcome the objections and rejections to the specification and claims, and that the claims are patentably distinct from the cited references. Withdrawal of the objections and rejections and passage of the claims to issue are earnestly requested.

Amendment under 37 C.F.R. §1.111
Sadahiko KONDO et al.

U.S. Patent Application Serial No. 09/747,971
Attorney Docket No. 001695

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees that may be due with respect to this paper to Deposit Account No. 01-2340.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Enclosures: Version with Markings to Show Changes Made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please amend the paragraph beginning on page 27, line 13 as follows:

If the grinding stone rotating speed is slower than 2000 rpm (i.e. the circumferential speed of 125.6 m/min), and if the relative speed of the grinding stones 36a, 36b is not slower than 3 mm/sec, the grinding stones 36a, 36b exert large grinding load, resulting in an increased number of chippings in the work 85. If the relative speed of the grinding stones 36a, 36b is decreased, ~~although~~ the chipping is eliminated but operation efficiency goes down to an extremely low level. On the other hand, if the grinding stone rotating speed is faster than 5000 rpm (i.e. the circumferential speed of 314 ~~mm~~ m/min), the coolant is not supplied to the grinding edge enough, and the number of chippings increases. Further, if the rotating speed exceeds 6000 rpm (i.e. the circumferential speed of 376.8 ~~mm~~ m/min), accompanying air flow around the grinding stones becomes too strong and the supply of coolant to the grinding region becomes insufficient, resulting in a seizure.

Please amend the paragraph beginning on page 28, line 3, as follows:

Even if the work 85 is a R-Fe-B magnet containing cobalt not smaller than 0.3 wt% and not greater than 10 wt%, the number of chippings can be reduced and the chamfering can be efficient if the grinding stone rotating speed is not slower than 2000 rpm and not faster than 5000 rpm, i.e. if the grinding stone circumferential speed is not slower than 125.6 m/min and not faster than 314 m/min. At this time, if the relative speed of the grinding stones 36a, 36b with respect to the outer circumferential portion of the work 85 is slower than 0.5 mm/sec, the grinding efficiency goes down,

on the other hand, if the relative speed is faster than 7.0 mm/sec, the grinding stones 36a, 36b exert large machining load, resulting in an increased number of chippings in the work 85. Therefore, the relative speed is not slower than 0.5 mm/sec and not faster than 7.0 mm/sec, and more preferably, not slower than 2.0 mm/sec and not faster than 4.0 mm/sec.

IN THE CLAIMS:

Please amend claims 7, 10, 12, 16, 17 and 19 as follows:

7. (Amended) A work chamfering method using a work holding portion including a first surface and a second surface, the first surface including a portion having a static friction coefficient greater than 0.1, the method comprising:

a first step of holding ~~the~~ a work with the work holding portion by contacting each of the first surface and the second surface with a main surface and another main surface of the work; and

a second step of chamfering the work by using a tool;

wherein the work holding portion is adapted to rotate the work around a center of rotation;

further wherein the second surface contacts the work at at least two contacting locations; and

further wherein the center of rotation is between the contacting locations.

10. (Amended) A work chamfering method using a work holding portion including a first surface and a second surface, the first surface including a center portion and two end portions, each of the two end portions having a static friction coefficient greater than that of the center portion, the method comprising:

a first step of holding the work with the work holding portion by contacting each of the two end portions of the first surface with a main surface of the work and contacting the second surface with another main surface of the work; and

a second step of chamfering the work by using a tool;

wherein the work holding portion is adapted to rotate the work around a center of rotation;

further wherein the second surface contacts the work at at least two contacting locations; and

further wherein the center of rotation is between the contacting locations.

12. (Amended) The method according to one of Claims 7 ~~through~~ or 10, wherein the tool includes a first grinding stone and a second grinding stone, and the second step includes a sub-step of moving the tool thickness-wise of the work, and a sub-step of chamfering another edge of the work with the second grinding stone.

16. (Amended) A chamfering method for chamfering a rare-earth sintered magnet by using a rotating grinding stone, ~~wherein~~ comprising the steps of:

rotating the grinding stone ~~is rotated~~ at a speed not slower than 2000 rpm and not faster than 5000 rpm, and

controlling the relative speed of the grinding stone with respect to an outer circumferential portion of the rare-earth sintered magnet is to be not slower than 0.5 mm/sec and not faster than 7.0 mm/sec, ~~for chamfering the rare-earth sintered magnet.~~

17. (Amended) A chamfering method for chamfering a rare-earth sintered magnet by using a rotating grinding stone, wherein comprising the steps of:

rotating the grinding stone ~~is rotated~~ at a circumferential speed not slower than 125.6 m/min and not faster than 314 m/min, and

controlling the relative speed of the grinding stone with respect to an outer circumferential portion of the rare-earth sintered magnet is to be not slower than 0.5 mm/sec and not faster than 7.0 mm/sec, ~~for chamfering the rare-earth sintered magnet.~~

19. (Amended) The method according to Claim 16 or 17, wherein further comprising the step of supplying a coolant having a surface tension not smaller than 25 mN/m and not greater than 60 mN/m ~~is supplied~~ to a grinding region.